## **MODULE 2, CHAPTER 2**

### 00:24

The next section in Module 2 for female infertility disorders are pelvic, tubal and uterine factors.

### 00:10

Here will be looking at endometriosis, tubal factors and uterine factors. Let's start with endometriosis. Endometriosis is a chronic condition characterized by the growth of endometrial tissue outside the uterine cavity within the ovary or invading the recto-vaginal septum. This is the same tissue that is sloughed off at during every menstrual cycle. The symptoms include dysmenorrhea, nonmenstrual pelvic pain and dyspareunia. Dysmenorrhea are painful periods; dyspareunia is painful intercourse.

As far as ovarian reserve, may be decreased and may increase the risk of a poor response to ovarian stimulation. The picture on the right-hand side of your screen shows you the typical ovarian endometrioma which is the dark area, which are also referred to as chocolate cysts.

### 01:20

For diagnosis of endometriosis, it can be done through and most often is through direct visualization, a laparoscopy and more uncommonly laparotomy and coupled with a pathology. The treatment can include superovulation and intrauterine insemination, IVF or surgery.

The effects on treatment, increased risk of dysmenorrhea and pain when treatment fails and during treatment due to the because endometriosis is an estrogen dependent disorder that women may experience more pain during treatment and also the treatment may stimulate the endometriomas to grow.

#### 02:12

In this diagram here, we can see the possible locations of the lesions of endometriosis and you can see that they can be in the rectal area, on the uterine wall, the bladder. And there have even been case reports of these lesions on the lungs and the brain. It can be a very pervasive disease or disorder and women experience from mild to very severe or chronic pelvic pain.

#### 02:49

Tubal factors in infertility. So, as we saw earlier the fallopian tubes are necessary for the transport of oocyte and sperm, and if there is scarring or damage to the fallopian tubes, it can interfere with the ability to facilitate passage of ova and sperm and also transport the zygote to the uterus. It's diagnosed through hysterosalpingogram, sonohysterogram or diagnostic laparoscopy.

Treatment can include surgical repair, which has limited success, and IVF, which bypasses the fallopian tubes and was actually the reason IVF was developed was to deal with tubal disorders. Also, too, if there is tubal damage, there is can be an increase of ectopic pregnancy. And also, inversely, ectopic pregnancy can cause tubal damage.

#### 03:58

So I look here at hysterosalpingogram, which is an X-ray using a dye to look at the patency of fallopian tubes. On the left we see a normal hysterosalpingogram result where you can see the spilling of the dye into the fallopian tubes. On the right, we see that there is something called a hydrosalpinx which is kind

of a ballooning of the fallopian tube due to partial blockage. And these are often the situations where we have scarring or blockage of tubes can often be caused by a sexually transmitted infection such as chlamydia.

# 04:47

So ectopic pregnancy is a pregnancy that occurs outside the uterine cavity, and if even with IVF, there is still a risk of ectopic pregnancy. It is diagnosed with ultrasound visualization and elevated hCG levels in the absence of a visible intrauterine gestational sac. It can be treated with methotrexate to reduce the embryonic tissue or surgery. 200:05:23:01 - 00:05:46:13

Uterine factors in infertility usually consist of a presence of normal uterine tissue such as endometrial polyps, submucous fibroids or intrauterine adhesions. And the concern here for conception is that these disorders may interfere with the implantation of the embryo.

## 05:50

Uterine factors are diagnosed through ultrasonography, sonohysterogram, hysteroscopy or hysteriosalpinogram and can be treated with surgery. And effects on fertility, as mentioned before, is disturbed implantation as they negatively affect the uterine environment.

## 06:14

During investigations, these congenital abnormalities are, although not common, may be found. Just going to point out on the top left the normal uterus and we have various versions of septated uterus where we have a partial septum, a full septum, where we have two horns of the uterus, but one cervix, just one horn. And what we call a didelphic uterus, where it's 2 complete uterus with two cervix. Not a common finding but something you might come across in practice. And these are more interfere with pregnancy or they can interfere with implantation too, but more with pregnancy concerns.

## 07:11

To summarize pelvic and tubal uterine factors, we have endometriosis where the symptoms include dysmenorrhea, nonmenstrual pelvic pain and dyspareunia, increased risk of ovarian cysts which can be treated using surgery, hormonal therapy or oral contraceptives and other medications, and they also can be treated with fertility, can be obtained through IUI or IVF if pregnancy is desired.

In tubal factor, we have HSG, sonohysterogram or diagnostic laparoscopy to aid in diagnosis. They can be treated with surgical repair or in vitro fertilization if pregnancy is desired. Also, ectopic pregnancy can occur and can damage tubes and can be treated with medication and surgery. Uterine factors can negatively affect uterine development or sorry, uterine environment and disturb implantation and can be both diagnosed and treated with hysteroscopy.

## 08:24

Module 2 female infertility disorders, unexplained infertility

## 08:32

Unexplained infertility is diagnosed when a person has failed to achieve a pregnancy after 12 months of attempting conception and has completed a thorough evaluation without finding a cause for the infertility. And this is probably one of the most frustrating diagnosis that a person can receive because they have had everything checked out. It's all fine and there still is not an identifiable reason.

For diagnosis, it's a clinical evaluation by exclusion, so the woman is ovulating, her uterine cavity is normal, her fallopian tubes are patent and the semen analysis is normal. However, the treatments can be used, the same infertility treatments can be used as other populations. Aromatase inhibitors, gonadotropins with an intrauterine insemination or IVF.

## 09:33

We will now move on to male infertility disorders.

### 09:38

There are many factors affecting male fertility, including genetic, varicocele which we'll discuss in this module, medications and so on. The largest diagnostic group is idiopathic or unexplained in 30 to 40 percent of males experiencing infertility.

## 10:00

WHO has produced these results, which show a lower reference limit, and these are the 2010 which are the most recent results that have been released. And of note when doing semen analysis with these are any lower limits may represent an issue with male fertility.

### 10:32

Sperm morphology is one of the important determinants of fertilization or conception. And here in this diagram on the left, we see a normal sperm, including the we saw this in a previous slide, but the acrosomal region and normally shaped head midpiece with the mitochondria for the energy to propel the spermatozoa and the tail, which is used for propulsion. On the right, we see many variations of abnormal sperm. So, if there is a head abnormality, it may be related to a genetic reason, although we can't test sperm to know their genetic makeup without destroying them. So can only go by visualisation.

#### 11:27

DNA fragmentation may be related to low morphology, and it might be although low morphology can be due to DNA fragmentation it also can be a structural chromosomal aberrations, immature chromatin or aneuploidy, which would be chromosome abnormality. The causes of DNA fragmentation, oxidative stress, environmental factors and possibly varicoceles. There is a test done to determine the amount of DNA fragmentation. So the more fragmentation there is then that will be considered abnormal and may impact fertility in that it has adverse effects on fertilization and embryo development. So sperm extraction can be done to reduce DNA damage to get healthier sperm and we'll look at that later on.

#### 12:31

Additional testing that can be done for to determine fertilization likelihood or antisperm antibodies in the antisperm antibody test, it can detect antibodies that work against a man's sperm or can damage or kill sperm. It has an effect on fertility and inhibiting sperm penetration into the cervical mucus and affecting the changes in the acrosome.

Leukocytospermia, which would be the presence of more than a million leukocytes per ml in ejaculate, is an indicator of infection or inflammation in the male sex glands and the urogenital tract. The effect on fertility is a negative impact on function, acrosomal damage and tail deformities.

#### 13:26:11

Male factor infertility treatment can be hormone therapy, aromatase inhibitors or SERM, selective estrogen receptor modulators or the use of reproductive technology such as intrauterine insemination, IVF with intracytoplasmic sperm injection, which we'll discuss later. Surgical sperm extraction that is getting sperm from the epididymis or testes, electroejaculation, fibrous stimulation or intrauterine insemination or IVF using donor sperm.

#### 14:10

We'll look at ejaculatory disorders. Ejaculatory failure results from a variety of causes, including pelvic nerve damage, diabetes mellitus most commonly spinal cord injury and can include psychosocial disorders. Retrograde ejaculation, sperm is found in urine samples after ejaculation due to a weakness in the bladder neck and there are some medications called sympathomimetic agents that can improve this.

#### 14:48

Also, erectile dysfunction can interfere with conception in that there is an inability to attain or maintain an erection sufficient enough to deliver sperm. Tt can be caused by age, diabetes, hypertension and other factors and can be treated with antidepressants, beta blockers or sorry, it's caused by certain antidepressants or beta blockers and also can be caused by psychological factors.

There are pharmacotherapies for treatment to help maintain or achieve and maintain an erection, but penile vibratory stimulation and electroejaculation, surgery in some cases, or penile prostheses or suppositories.

#### 15:46

And here we see a diagram of electroejaculation primarily used for men with spinal cord disorders or injury, where there is a probe inserted into the rectum, a mild electric current used to produce an ejaculation where the semen can be collected and used.

#### 16:10

So for men, endocrine abnormalities and infertility can occur through diabetes, where there may be disturbances in emission or retrograde ejaculation in congenital adrenal hyperplasia. Hypogonadotropic hypogonadism, as we saw in the female population, hypothyroidism or due to a pituitary tumor.

#### 16:40

Varicocele is something that you will come across in practice, not uncommonly, which is abnormally dilated veins in the pampiniform plexus, which are caused by faulty valves in the spermatic vein and subsequent engorgement of the pampiniform complex. They can be diagnosed by several meeting means with physical exam and scrotal ultrasound are the most utilized methods.

#### 17:11

So how do they relate to infertility? We see them in 21 to 41 percent of men with primary infertility and are the most surgically correctable of causes of male infertility, although the impact or the success with fertility is variable. There are been a variety of operative and non-operative approaches, including laser, that have been developed for varicocele repair.

And their relation to infertility is that they can cause impaired sperm at agenesis due to the altered impaired blood flow, increased scrotal temperature and oxidative stress on the sperm.

Sex hormone changes can occur, as can a reflux of adrenal hormones or autoimmunity due to varicocele.

# 18:07

So for genetic reasons, for infertility, such as hypo-hypo, one of the most common is Klinefelter's syndrome, where you see there's 2 X chromosomes and 1 Y and may manifest with tall stature, reduce fertility and other abnormalities.

When a blood test is done, you would see a low testosterone level, high sex hormone binding globulin and elevated gonadotropins. Treatment for fertility would be microsurgical testicular sperm extraction and the use of intracytoplasmic sperm injection.

## 18:57

So idiopathic or unexplained male infertility. As mentioned before, 30 to 40 percent of subfertile men may have idiopathic infertility and genetic factors may be a contributing factor. And if there's no correctible diagnosis, identified fertility treatments such as IUI and IVF with or without ICSI are used.

And it does remain unclear and this is an area of future research as to how advanced paternal age may impact fertility and conception rates.

### 19:33

Summarize male factor infertility, multiple factors affect male fertility. Semen analysis is the gold standard test to test for infertility and includes the sperm volume, concentration, motility and morphology. Varicocele is an abnormal dilation of spermatic cord veins, often associated with impaired spermatogenesis and endocrine abnormalities may affect fertility such as diabetes, congenital adrenal hyperplasia, hypo-hypo or hypothyroidism.

Also, as can ejaculatory disorders or erectile dysfunction. And there can be genetic factors and paternal age is a bit of an unknown, but may be a factor for male infertility.

## 20:29

Section completed. Please access the online classroom portal Digital Chalk to review and complete the exercises related to this content section.